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SCIENTIFIC AFFAIRS

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SCIENTIFIC AFFAIRS

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CEMA MEMBER NATION COOPERATION IN COMPUTER CONSTRUCTION

Moscow RADIO in Russian No 11, 1979 pp 2-4

[Article by A. Grif: "In the Name of October"]

[Text] The People's Republic of Bulgaria. "Decades will pass," said the chairman of the Bulgarian Council of Ministers, S. Todorov, at the 23rd meeting of the CEMA session, "but mankind will not forget the discoverers of the new economic order born of the socialist revolution, the creators of the relationships of fraternal cooperation between free and equal peoples . . . ."

These words apply completely and in their entirety to the cooperation of Bulgaria in the field of electronic computer design and production. As a result of the joint efforts and fraternal assistance of the Soviet Union and other socialist nations over the ten years of participation of Bulgaria in the intergovernmental commission of the CEMA, computer production has developed at unprecedented rates. In just the period 1971-1975 alone, the average annual increase in the output of electronic computer equipment reached 53 percent, and over the period 1975-1979, it will amount to 20-30 percent more.

The practical realization of the principle of the international socialist division of labor, as well as production specialization and cooperation in the field of electronic computer equipment have made it possible for the Bulgarian People's Republic to direct its efforts towards the design and production of specific types of equipment in shorts periods of time, specifically: central processors, disk memories, and remote data processing systems. For example, the YeS 5667 system of memories using magnetic disks was designed for use as the memory of the "Ryad-2" electronic computers.

Bulgarian specialists have designed modern data preparation devices and an entire range of peripheral memories for the machines of the SM EVM [the international system of small computers].

*

The People's Republic of Bulgaria. Electronic computers equipment is widely used in the agricultural industrial complexes which are becoming the basic form for the organization of agriculture in Bulgaria. In the photograph: the computer center of the "G. Dimitrov" agricultural industrial complex in the village of Pyrvenets (Plovdivskiy district).

*

The Bulgarian Communist Party and the government of the republic have planned a program for the accelerated introduction of YeS EVM [unified system of electronic computers] and SM EVM equipment in diverse sectors of the national economy for the purposes of economic and social development of the nation. Some 35 electronic systems and 350 subsystems are already in successful operation at machine construction, electronic and electrical engineering industry plants. They are intended for automating production processes. More than 80 ASU's [automated control systems] control the enterprises and associations, and more than 800 ASU subsystems are in service in various sectors of the economy. For example, through the joint efforts of the USSR and Bulgaria, an ASU for a copper ore dressing combine and an ASU for street traffic in Sofia and others have been created.

The experience of Bulgaria in the design and utilization of the "agriculture" ASU is of particular interest.

The Hungarian People's Republic. "The development of the CEMA nations," underscored the chairman of the Hungarian People's Republic Council of Ministers, D. Lazar, at the 23rd meeting of CEMA session, "over a period of three decades has been creating favorable conditions for strengthening

At the present time, more than 500 small, medium and large computers are in service in the Hungarian People's Republic, as well as more than 400 minicomputers which service about 1,500 subsystems at industrial enterprises.

the multilateral economic ties, and for the further development of socialist economic integration."

A third of this time goes for the time period that the intergovernmental agreement of the CEMA nations on the joint development and production of modern computers is in force. The cooperation of Hungary with the Soviet Union and other fraternal nations has led to the development of a powerful electronics industry in the Hungarian People's Republic, a solid scientific base and the wide-scale introduction of computers into the national economy. On the basis of the governmental program for the development of computer engineering, adopted in November of 1971, scientific and design work has been expanded in the nation, and the foundations have been laid for the creation of powerful industrial enterprises.

The German Democratic Republic. The YeS 1040 computer, designed by the "Robotron" state enterprise is successfully operating in the USSR Gossnab [State Administration for Material and Technical Supply], in the state bank of the Czechoslovakian SSR in Bratislava, in the planning organs of Cuba and in the Hungarian Power Engineering Institute. In the photograph: An information system based on the YeS 1040 in the international center for scientific and technical documentation.

The Hungarian People's Republic has now become one of the active participants in the realization of the YeS EVM and SM EVM programs, having taken on itself the development and production of small computers, peripherals for them and remote data processing devices and systems. Hungarian specialists have successfully been involved in the software for the equipment they have designed.

The YeS 1010 computer, which was designed in the Hungarian People's Republic, and its series of modernizations have found wide applications both within the country and in a number of socialist nations.

Hungarian specialists recently designed a new computer: the YeS 1015. The developmental work on the YeS 1016 is being completed. These computers belong to the "Ryad-2" models.

Over a period of 10 years in the YeS EVM program, about 40 units have been developed and undergone international tests. Some 16 devices have likewise undergone testing in the SM EVM program. Display terminals and various peripherals occupy a special place among them.

Hungarian specialists are now designing yet another new computer model - the SM 52/10. It is intended as an interface between the SM EVM computers and the YeS EVM series.

The German Democratic Republic. "History has confirmed," stated the chairman of the GDR Council of Ministers, V. Stof, at the CEMA session, "that membership in the CEMA is one of the fundamental conditions for the creation of a socialist economy in the first state of workers and peasants on German soil."

"True to the principles of socialist internationalism, the Soviet Union is offering its enormous economic and scientific and engineering potential for the universal strengthening of fraternal friendship."

"One of the brilliant illustrations of this assertion is the creation, development and activity of the largest scientific and industrial association in the GRE: the "Robotron" state enterprise.*

Electronic computer equipment designed by the 70,000 member "Robotron" collective, is being used in all of the sectors of the GDR national economy. In close cooperation with Soviet enterprises and the enterprises of other fraternal nations, "Robotron" is successfully participating in the implementation of the program for the design of YeS EVM and SM EVM machines, which is leading to the most efficient application of electronic equipment in the national economy.

The Republic of Cuba. "Mongolia, Cuba and Viet Nam," said the deputy chairman of the State Council and the deputy chairman of the Council of Ministers of the Republic of Cuba, D. Rodriguez, at the CEMA session, "are an example of the backwardness, due to many centuries of colonial and neocolonial domination. Now, as a reuslt of cooperation within the CEMA framework, they are strengthening the economy and improving the well-being of the populace . . . . we express out gratitude to the Soviet Union, the great motherland of Lenin, which by virtue of its historic leadership role, enormous power and influence is a genuine symbol of our socialist cooperation."

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* See the article by the general director of the "Robotron" state enterprises, V. Ziberav, RADIO, 1979, No. 10.

The Soviet Union and Cuba are firmly tied together with thousands of threads. They have multiple plans for fraternal cooperation in the field of economics, science and engineering, and also including within the framework of the program for the creation of the unified system of computer equipment of the CEMA nations.

In 1976, a national institute for computer engineering was created in the Council of Ministers of the Republic of Cuba. With the rights of a ministry, it took over the administration of this young, but rapidly developing sector of the national economy. A few years in all have passed, and Cuban specialists energetically involved in the realization of the YeS EVM program, using their own experience and the experience of friends, were able to show the most modern equipment, including the family of SID-300 and SID-400 minicomputers, as well as alphanumeric and graphic display machines at the international exhibition of "YeS EVM and SM EVM and their applications" exhibition in July of 1978 in Moscow.

Cuban specialists have designed and constructed an automated control system for the sugar industry. This system, which our Cuban friends have named the "Datasuker", is already in operation. It combines 10 subsystems at sugar refineries. The technical basis for the system is the SID-300 minicomputers, installed at sugar refineries, and YeS EVM, with which the main computer center is equipped.

*

The Hungarian People's Republic. The YeS 1015 system, which Hungarian industry produces for the needs of its own national economy and CEMA nations within the framework of the YeS EVM program.

*

The equipment designed by the Cuban specialists in friendly cooperation with Soviet Union designers is being successfully used in the teaching process. The introduction of electronic computers has increased the efficiency and quality of teaching in the school imeni V.I. Lenin: one of the best schools in Havana.

•

The Czechoslovakian SSR. Czechoslovakian specialists, including designers, have worked a great deal and successfully on the design of the new computer of the "Ryad" series: the YeS 1025. In the photograph: at the control console of the YeS 1025.

•

The Cubans speak with rightful pride about the fact that only through cooperation within the CEMA framework has such a small developing nation as Cuba, located thousands of kilometers from the other socialist nations, been able under the conditions of an economic blockade to achieve significant successes in the development of one of the most complex fields of modern engineering.

The Polish People's Republic. "Economic and scientific and engineering cooperation with the CEMA nations," emphasized the deputy chairman of the Council of Ministers of the Polish People's Republic, M. Yagel'skiy, at the CEMA session, "is one of the most important components of the social and economic policy of the Polish People's Republic. This is an important factor in the development of economics, science and engineering."

It is specifically on the basis of this policy that the Polish People's Republic has successfully achieved significant results in a short period of time in the area of the development of a new industrial sector: the computer engineering industry. A clear idea of its high level is provided by the largest enterprise of the Polish People's Republic: the "MERA" association of the automation and instrumentation equipment industry. More than 50,000 persons are now at work in it. In just the last decade, "MERA" plants have come out with more than 600 large computer systems and [illegible],600 minicomputers. The "MERA" association has now set about the delivery of problem oriented computer complexes in accordance with the requirements of enterprises, organizations and scientific research institutions. These complexes are outfitted with equipment designed in the YeS EVM and SM EVM program, as well as with the requisite software.

The Socialist Republic of Rumania. "We have travelled a path together," stated the prime minister of the Socialist Republic of Rumania, I. Verdets at the meeting of the CEMA session, "and results have been achieved in relationships of comradely cooperation, which have arisen between our n nations and peoples, and which permit us to confidently look to the future of our economic and scientific and engineering cooperation. . ."

The participation of the Socialist Republic of Rumania in the work to realize the comprehensive CEMA program in the field of computer engineering has made it possible to develop this important industrial sector in the republic at an extremely fast rate. The production volume of electronic computer equipment in the nation has grown at the present time, as compared to 1972, by ten times, and over the five-year plan from 1975 to 1980, it will increase by more than four times. Within the framework of the intergovernmental accord on cooperation of socialist nations in computer engineering, the Rumanian specialists are working in the field of the development of minicomputers, the technical equipment for them, as well as comprehensive servicing systems for computers.

The Czechoslovakian Socialists Republic. ". . . economic and scientific and engineering cooperation with the CEMA nations," said the chairman of the Czechoslovakian SSR government, L. Shtrougal, in his address to the meeting of the CEMA session, "is of considerable importance for the stable and dynamic development of the national economy. Within the framework of these multilateral mutual relationships, economic relationships with the USSR are dominant, a nation which plays the outstanding role in the development of socialist cooperation."

Cooperation between the CSSR and the Soviet Union as well as other CEMA nations is developing on a wide scale and in diverse ways in the field of computer engineering. It has allowed Czechoslovakia to concentrate its efforts, resources and finances on a specific field of computer engineering, focus its production on the manufacture of specific equipment and devices and achieve considerable results in a short time.

In the CSSR, the production of electronic computer equipment has been concentrated in the "ZAVT" association: automation and computer equipment plants. Some 14 enterprises are included in the association.

Within the framework of the YeS EVM and SM EVM, Czechoslovakian industry is specializing in the production of the YeS 1021 and YeS 1025 machines. In the future, the series will be extended with the YeS 1026 and YeS 1027 models. New components and assemblies, as well as new software methods will find application in these computers.

Specialists of the CSSR, in cooperation with Soviet specialists, are successfully at work on the design of minicomputers. Several models of such machines of the "ZAFT" enterprise are already being produced for the Soviet Union, the CSSR and other nations.

Over the past years, the production of peripherals has undergone considerable development in Czechoslovakia. Several of them are produced in such quantities that they can be found in practically the majority of electronic computer systems which are in service in the CEMA nation. In Czechoslovakia though, devices, equipment and instruments made in the USSR, the Bulgarian People's Republic, the German Democratic Republic, the Hungarian People's Republic and other socialist cooperating nations are used in the majority of automated control systems.

The victorious concepts of October illuminate the way to the future for all of the peoples of socialists nations. ". . . . the foresight of the great Lenin concerning the friendship and fraternal relationships of nations founded on mutual understanding and mutual trust, on the agreement of basic interests and good will agreement has come true," it is stated in the declaration of the 23rd CEMA session on the 30th anniversary of the Council of Mutual Economic Assistance, "the new forms of human society created by socialism are an example for the peoples of the entire world . . . ."

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CSO: 1863

RYAD COMPUTER FLOWLINE CONFIGURATION INCREASES EFFICIENCY

Warsaw WIADOMOSCI TELEKOMUNIKACYJNE in Polish No 7-8, Jul-Aug 79 pp 211-216

[Article by Antoni Wiesnowski, mgr engr of the Information Science Research and Development Center (OBRI): "Development of Processing Technology in the Computer Systems of the 'RYAD' Uniform System of Electronic Digital Computers"]

[Excerpts] The increasing number of Uniform System [JS] computer installations in Poland justifies the appropriateness of considerations on the subject of the technology of processing on these computers. Usually, 2-3 years of operational experience are needed in order to formulate knowledgably the technology of processing and the realization of its development.

This article is an attempt to communicate such experiences in the operation of the Uniform System computers in the Information Sciences Association [ZI] and to present the results of the work from the area of processing technology that were achieved in the Information Science Research and Development Center [OBRI]. To start, a brief description of the characteristics of the Uniform System computers is necessary.

Characteristics of Uniform System Computers

Among the Uniform System computer models, the following models have been installed in Poland: R-20, R-22, R-32, and R-50. By describing the aforenoted computers the most, in general terms, it is possible to state that their computing capacity increases together with the designation number of the central unit under the condition of providing the installation with a suitable size internal memory and disk memory as well as other input/output equipment (Table 1).

Table 1. Comparison of the Parameters of Uniform System Computers

Model of EDC	Producing Country	Internal Memory Capacity in Kilobytes	Processor Speed in Thousand Operations/sec
1020	USSR	128-256	20
1022	USSR	128-512	80
1032	Poland	256-512	300
1050	USSR	512-1,024	500

Two operating systems are used on the Uniform System computers: the Disk Operating System [DOS] and the Operating System [OS]. The DOS system is designed for small and medium size installations, whereas the OS is designed for medium and large size installations. Three hardware parameters govern the practical and minimal requirements of computer configuration for the functioning of a specific operating system. They are:

processor speed (designation number of the central unit);

internal memory capacity;

disk memory size.

In the selection of an operational system, other factors should also be taken into consideration, for example, in which system of operation is the desired software practicable (Table 2).

Table 2. Practical Parameters of Hardware for Operating DOS and OS Systems

Practical Parameters		DOS	OS
Ryad Number [R] of central unit	minimum	20	22
	av. sufficient	22	32
Internal memory capacity in kilobytes	minimum	128	256
	av. sufficient	256	512
Disk storage capacity in megabytes	minimum	30	90
	av. sufficient	90	180

RODAN Data Base

The work on the RODAN system done by about 40 programmers on a Model 50 IBM/360 Computer under the control of an OS MFT operating system, with the use of the IBM 2770 heavy terminal (card punch and printer) to remote job entry (RJE) at the beginning of last year exceeded 12 hours per 24-hours of computer time granted to the exclusive disposition of OBRI (including 2 hours of remote entry sessions. The need for computer time continued to increase and exceeded the capacities of the installation owner; the work on the RODAN system was threatened with delay. A decision was taken to work up a special processing technology. After fundamental analysis, it was decided to:

--Replace the OS MFT system with an OS MVT system having an optimally selected in-house software system, which brought about: an increase in system operating speeds and lower susceptibility to error of the software used. The dynamic structure of the PAC [central memory] makes its optimum utilization possible.

--Replacement of the RJE system by the HASP system. Increase in internal memory on useable software; increasing the reliability of the system through better analysis and correction of errors--automatic resumption of interrupted operations; possibility of transferring operations from a remote session to a local (night) session.

The results attained exceeded expectations. The output of the remote session increased by 2-3 times. The overall flow capacity of the installation rose by 40-50 percent, and currently, in spite of a continued increased intensification of work on the RODAN system (of about 20 percent), the requirement for computer time dropped to 10 hours per 24 hour period.

The high effectiveness of the processing technology was achieved to a great measure because of the HASP system.

HASP System

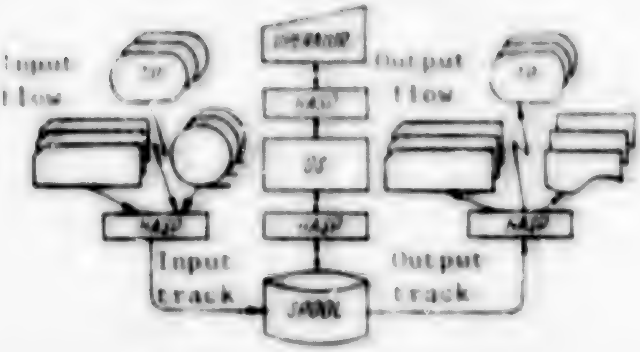
This system is the expansion of the OS operating system and provides for additional services in the area of handling operations, data, and problems.

HASP can be defined as a "front-end" processor for OS, which works as an automatic coordinator and operator of the OS system through the "spool"* functions effected without HASP through input read-in programs (READER) and printout programs on a printer (WRITER). Thanks to this method of connections with the system, it was possible to obtain many functional, operational, and output results (Graph I).

---

* The "spool" functions encompass the read-in of the input flow (JCL, programs and data) from the reader onto the intermediate disk memory, and the output of results from the intermediate disk memory onto the printer.

Graph I. The HASP System Functioning Concept



The HASP system is one of the technological elements of the version of the OS operating system developed in OBRI.

Technological Version of the OS Operating System

This is a compilation of packages and programs worked out for the purpose of improving the software technology and processing on Unified System computers.

The technological version of the OS operating system is used at 12 Unified System computer installations (as of 1 February 1979).

Since the first Unified System computers installed in the establishments of the Information Science Association (R-20 and R-22), were supplied together with a DOS operating system of limited capacities, the technological version of the DOS operating system (TWS DOS) was worked up in OBRI. The basic element of the TWS DOS is the POWER II System.

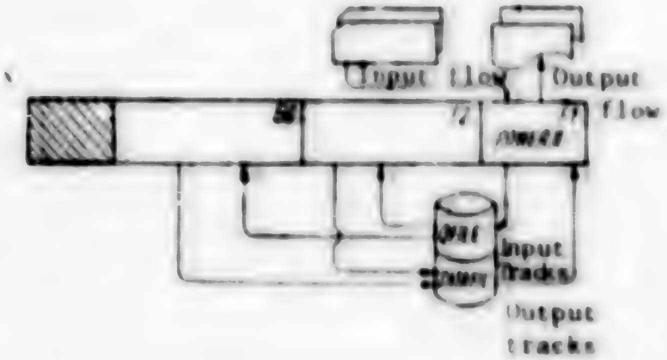
The POWER II System

This is a "front-end" processor for the DOS operating system, analogical to the function of the HASP system relative to the OS system. POWER II provides additional services in the area of handling operations and data.

The standard of the DOS system provides for processing the regular operations fed in from the input equipment, which usually is a card reader. The results are drawn out onto output equipment of the printer or card punch type. With such a set up, there is little employment of the central unit. For its operation depends upon relatively slow operating printer and reader type equipment.

The aforenoted drawbacks can be eliminated to a great extent through the implementation of the POWER II system, which carries out the "spool" functions or schedules the sequence of performance of operations for flow processing under the DOS operating system (Graph II). The basic advantage of the application of the POWER II system is the provision of "spool" functions for the DOS system, which to a certain sense brings this system closer to the organization of processing analogus to the OS system.

Graph II. The POWER II System Functioning Concept



Technological Version of the DOS Operating System

The technological version of the DOS operating system is used at eight Unified System computer installations (as of 1 February 1979).

The technological versions of the DOS and OS systems, and especially the POWER II and HASP systems used in them, are an attempt to improve the processing technology both from the standpoint of the installation owner (increased flow capacity) and from the user of the equipment (new capacities). This corresponds with the conclusion in the first part of the article.

Further Development of Processing Technology

This development ought to be steered in the direction of improving the services to the user. The "closed door" principle was appropriate for second generation computers, when the introduction of operating systems made central processing of programmed operations possible and created the necessity for such processing.

The development of processing technology is making it necessary to use the "open access to storage" along with the "closed door" principle, from the standpoint of the user.

It is necessary therefore to make possible:

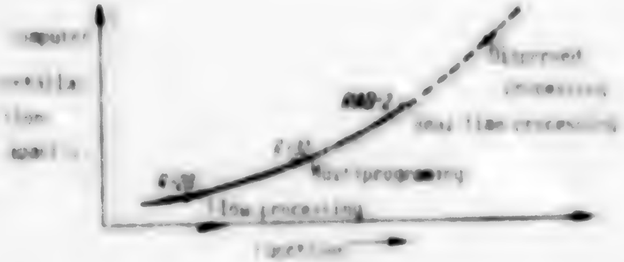
--conversational program initiation;
--remote flow processing of operations;
--random access of the user to the data base.

The standard OS system contains two products servicing the conversational initiation of programs. They are the CRJE (Conversational Remote Job Entry) and the TSO (Time Sharing Option). The CRJE requires 130 kilobytes on the control module and does not serve the screen monitors, but only the teleprinter monitors. The TSO is a decidedly better-developed system as compared to the CRJE; however, the greater capacities bring about an increase in requirements with respect to the computer configuration, at the same time. For its operation, the TSO requires the MVT version of the OS system encompassing a minimum of 140 kilobytes of the internal memory. The service of the telecommunication equipment is realized with the use of the TCAM access method, the module of which occupies a separate storage area of a minimum size of 70 kilobytes. A memory for the TSO control module with a minimum size of 80 kilobytes is also added to these requirements. Of the standard size of 512 kilobytes for an R-32 computer memory, in the best case, about 220 kilobytes are left over for the operational programs, which practically excludes parallel batch processing under TSO operation.

Remote flow processing of operations is possible in the OS system under the control of the RJE (Remote Job Entry) system or of the HASP system. With respect to these systems, which were noted in this article, it is necessary to emphasize again the decisive superiority of the HASP system over the RJE.

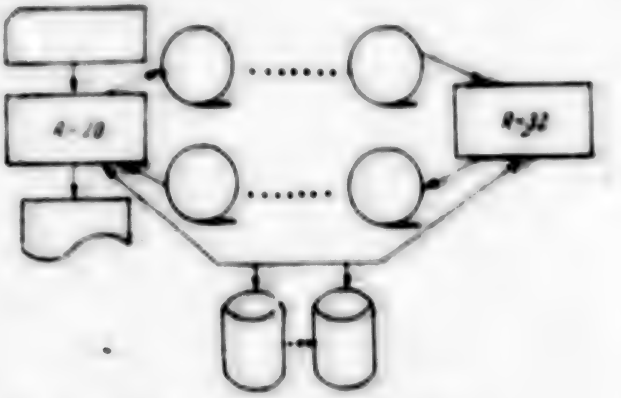
The IT monitor developed for the RODAN system can be an example of the servicing of a direct user without data. This monitor serves a display type device and requires 64 kilobytes of internal memory (Graph III).

Graph III. Development of Processing Technology

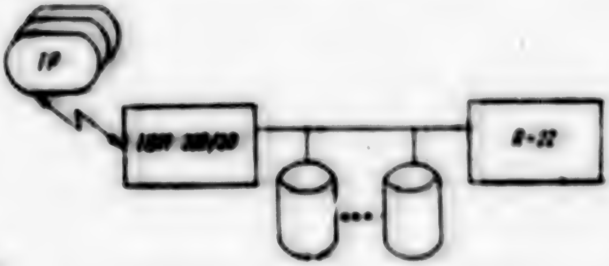


A barrier to the application of modern processing technology is the computing capacity of the currently used hardware. Here, mention should be made of the attempts at increasing the computing capacity of computers through connecting them up in flowlines. One of these is the utilization of a low-capacity Unified System computer (R-20) for the preparation of operations and the output of results and the use of a higher capacity computer (R-32) for doing the computations (Graph IV). Another trial is the research work currently in the ZOWAR Computer Computation Enterprise: a two-computer system with remote access servicing. The concept is based on the remote entry of operations and the output of results from an

IBM 360/50 and the conduct of computations on an IBM 360 and an R22 connected to an internal disk memory.



Graph IV. R-20 and R-32 Flowline



Graph V. Two-Computer System of Remote Access servicing

The realization of systems of remote access servicing and the connection of the computers in flowlines are preparatory stages for the emergence of computer networks, which are currently the most effective form of utilising the computing capacity of unified installations. However, networks of dispersed data bases are the most effective form of serving the needs of the users.

The realization of a network of computers requires, however, the fulfillment of the following conditions:

--Training of Personnel. The planned and coordinated training of skilled computer scientists, creators of the softwear, is necessary. This is to be done through seminars, conferences, study tours abroad, and more universal accessibility of the literature of the field.

--Increasing the capacity and the standard set up of the installations. One megabyte operating memory, 500,000-800,000-operations/sec processor, and 300-500-megabyte disk memory.

--TP hardware accessibility. Communications processor, processors for the realization of functions and terminals.

--Raising the quality of lines. Transmission speed of [illegible],500-9,600 bauds.

Summary

The development of processing technology in Unified System computer systems should be headed in the direction of simultaneous increasing of the effectiveness and the reliability of the service.

Processing technology realizes individual goals and is dependent upon the computing capacity as a function of the units of an installation and the operating system used, as well as the needs of users or equipment owners.

The technological version of the OS and DOS systems worked out in OBRI with the HASP and POWER II systems has increased the effectiveness and reliability of service.

The further development of processing technology should include the principle of "open access to storage" from the standpoint of the user. This means making possible remote access to conversational and flow initiation of programs and the processing of operations with the approaching computer network-dispersed data base type set up.

5308
CSO: 2602

GERMAN DEMOCRATIC REPUBLIC

TECHNICAL COLLEGE COOPERATES IN EDP, AUTOMATION DEVELOPMENT

East Berlin DAS HOCHSCHULWESEN in German Vol 27 No 11, Nov 79 signed to press 3 Oct 79 pp 307-310

[Article by Prof Dr Gerhard Linnemann, engineer; rector, Ilmenau Technical College; director, Information Technology Scientific Research: "The Contribution of Ilmenau Technical College to the Development of an Effective Basic Research and Applied Research Focused on Main Economic Problems"]

[Text] The aggressive posture of scientists and technicians is measured today by top-flight and record performances in all economic sectors, especially in the productive sphere. Interdisciplinary collectives made up of scientists and engineers, cadre active in the technical-economic field and solidly grounded in science, are producing these very achievements. Their performances are being measured by results in microelectronics and the development of manipulators and industrial robots, automation, regulation systems and control systems; by the decisive raising of labor productivity to new dimensions; and by the realization of scientific-technical and technological results in industrial practice.

As essential as these objectives are, the central task of the [Ilmenau] Technical College is reflected in the training of communist cadre -- young engineers and the coming generation of scientists, advanced school instructors and plain scientists. It is therefore an essential concern of all scientists and advanced school instructors to establish and maintain the unity of education and training, research and teaching, theory and practice.

We are seeking these close ties with the functioning economy, with industry, the combines and industrial research institutions and with the GDR Academy of Sciences [AdW]. We are also developing them on a contractual basis for purposes of expanding the technical base for training and research.

Comrade Erich Honecker stressed at the Ninth SED Party Congress that intensification of our economy depends to an essential degree on the acceleration of scientific-technical progress, and the dynamics of our economy are decisively determined by such acceleration. Attainment of these objectives poses a great responsibility for science and technology. Strategic orientations for basic and applied research designed to establish a scientific lead in line with our economic requirements are provided by the conceptions on long-range development of basic research in mathematics and the natural sciences, as well as development of natural science and technology for important sectors of the economy up to 1990, and by the basic directions of research in the social sciences (3).

Interim results and positions attained were presented and discussed at the Joint Conference of the AdW and MHF /Ministry for University and Technical School Matters/ on 1 and 2 June 1978 in Berlin (5).

In his concluding statement at the 10th Central Committee Plenum, SED Central Committee General Secretary Erich Honecker termed the strengthening of our country's economic efficiency the central issue upon which progress in all areas of our lives is critically dependent (1).

The planned development of science and technology -- measured by international standards, which are determined by the advances in modern science -- and economic exploitation of the results are increasingly becoming vital factors in this regard (4).

Charged with a special responsibility in this process are the technical and engineering colleges. Through the training and communist education of secondary-school graduates and other highly qualified cadre, they are responsible for producing a firm Marxist-Leninist world view in tomorrow's vehicles and initiators of scientific-technical progress in industry. The development of highly qualified cadre requires modern high-level training and work-related research which are conditional upon one another and which have a mutually productive influence.

On behalf of or together with industry, effective scientific-technical results have been achieved and transferred to production since the Eighth SED Party Congress, with particularly successful results following the Ninth Congress.

A few examples follow:

Development of the operating system and the application software of the efficient CEMA hybrid computer systems (HRA 4241/HRA 7000); production cooperation by collectives from the Ilmenau Technical College, the Robotron ZFT /Central Office for Research and Technology/ and Aritma Prague (CSSR);

Development of the plasma burner for the high-grade steel furnaces at Freital; production cooperation by research collectives from the Moscow

Energetics Institute, the Moscow VNIETO and the Ilmenau Technical College in cooperation with the Hennigsdorf LEW /Locomotive Construction and Electrotechnical Plant/;

Stabilization of the totally electric smelting plant at the Ilmenau Industrial Glass Combine VEB; by the Ilmenau Technical College's collective from the scientific sector for information technology in cooperation with the enterprise collectives and the Jena-Burgau WTG /Scientific-Technical Society/;

Design of a series of devices based on direct digital transduction of measured data (digital scale, linear measuring instruments, process scales) in cooperation with the Dresden Nagema /Foodstuffs, Luxury-Foodstuffs and Packing Machines/ VVB /Association of State Enterprises/, the Dresden Analytics VEB and Carl Zeiss Jena VEB;

Development of a continuous process for the electrochemical production of copper foil; research collectives from the Ilmenau Technical College together with the Hennigsdorf LEW VEB;

Design and development of a microcomputer-controlled automatic microelectronics device; an interdepartmental and supraenterprise research and development collective made up of staff members of the Anna Seghers Tube Works VEB in Neuhaus (HWN), the Dresden Electromat VEB (EMD) and the Ilmenau Technical College.

These projects -- most of which were awarded the National Prize of the GDR or the Banner of Labor upon successful completion -- provided our collectives with a wide range of experiences in cooperation with partners in the economic apparatus, industrial branch managements and CEMA partner institutions. In any event, they involved effective productive achievements and the elaboration of scientific-technical solutions which determine world standards. Findings and results from microelectronics have been given greater weight at the Ilmenau Technical College as a result of evaluating the Sixth Plenum and especially the lecture and working visit by Minister for Electrical Engineering and Electronics Otfried Steger.

Our experience and results have shown that the following conditions must exist:

Long-range future solutions with broad possibilities for application at the Technical College; for example, mastery of computer systems (active and passive), sensor and positioning systems for automatic machines and manipulators and so forth;

Knowledge of the partner's experiences and skills and material and personnel resources for development and production;

An effective organization of common goals, purposes, methods and results;

A coordinated set of objectives with goals (exact specifications) and deadlines, detailed down to material and honorary possibilities for stimulating the active collectives (establishment of genuine incentives, clear differentiation among honors awarded for outstanding achievements).

It is our experience that projects and tasks of great economic importance produce effects that are extraordinarily mobilizing. The social necessity of realizing a project, a set of objectives, has a stimulating effect on the work of all members of the scientists' collective under the direction of the most progressive forces, the [SED] party scientists (2).

Tasks like these almost always are very complex and require in principle interdisciplinary, interdepartmental, supraenterprise and international cooperation.

A precise breakdown of tasks by individual scientists and staff members, a determination of individual responsibilities, strict schedules and content for management and coordinated reporting and regular consultation on problems established the necessary prerequisites for the swift elimination of subjective as well as objective obstacles.

The projects were evaluated by the rector of the college, by the college management and managements of the partner institutions. Corrections and management decisions were due and necessary in some cases, including those that had to be made at higher party management levels (of the bezirks and kreises) and by leading state organs.

It seems important to point out that the material means employed were used very little. It appears to be an essential fact that, with almost all members of the collective, personal interest in improving qualifications coincided with the technical orientation. Also acting as an incentive was the fact, for example, that the task of applying modern microelectronics and new hardware solutions (positioning systems, digital sensors, power transducers) was recognized as fascinating and that new scientific-technical ground was being broken on an international scale.

With reference to these tasks, in principle the college and enterprise collective broke with the practice -- still frequently used at our college -- of isolated preparation, a practice that is often restricted to the submission of specifications and a defense of production phases to the client. Contributing substantially to a reduction in transfer time were exchanges of ideas and experiences.

College scientists often assumed high risks, since insufficiently tested basic research results went directly into phases K-2 through K-5.

As the process of arriving at a solution went on, supraenterprise cooperation was marked by a true partnership and socialist teamwork that depended upon mutual respect for and acknowledgment of the accomplishments of each person. A set of objectives like this one, difficult in terms of schedule as well as capacity, which called for a large measure of instrument development in addition to clarification of problems of basic research, can of course only be accomplished within a limited time frame if the unity of teaching and research is not to be disrupted. Since, however, the process of attaining such objectives presents an excellent testing ground for formation of the individual, specially suited staff members ought to be given the opportunity to manage and participate in these collectives during their training at the college. It is our view that astute planning and management of scientific work at the department and college level, in collaboration with industry and aimed at accomplishing economically significant tasks, should create test situations such as these, especially for potential professional management cadre.

The long-range planning required for this for all staff members in a department is not an easy task. The functional directorates for research and cadre/qualification have to have excellent coordination in their work with the departments.

It is important to avoid the overburdening of individual scientific sectors over lengthy periods. Also of importance is the long-range formulation of world standard-setting projects by the leading scientists at the college. Every teacher at the college bears a serious responsibility in this regard, especially the leading party scientists.

The work with and successful accomplishment of objectives like these set high standards for the appraisal of performances within the college and exert a mobilizing influence on all teaching and research work. It further shows the creative potential that exists in our secondary-school graduates and staff members whenever they are adequately challenged by lofty goals and whenever the engineer's political responsibility for accomplishing the task is grasped. In this sense we understand how to make full use of the advantages of our society to achieve a close association between science and production for the benefit of social progress. It was the accomplishment of these kinds of tasks that decisively supported the adoption of microelectronics, microcomputer technology and scientific instrument construction into the teaching and continuing education programs at a high level of quality and within the shortest period of time.

Today, [illegible] years after the Sixth SED Central Committee Plenum, we can say that the application of microprocessor and microcomputer technology to the development of modern hardware is largely a regular department practice for the most varied areas of application within the economy. This process has been carried forward by the college's in-house continuing education programs. Cooperation among all departments and the college's Institute for Marxism-Leninism has produced for practicing cadre in industry a 2-year postgraduate course of study entitled "Microprocessor and Microcomputer Technology." The course will be conducted for the first time beginning with the 1979/80 academic year and is in great demand.

The socialist competition in honor of the 30th anniversary of the founding of the GDR saw a number of developments relating to the practical application of microelectronics. These ranged from development of the college's own design and programming positions for microelectronic components, to systems solutions for automation technology by way of providing documentation for multichannel processor regulators, and ending with the use of microcomputers in other hardware solutions for communications technology and robot technology. This process could be accelerated even further if industry were to speed up its production of microelectronic components and microcomputers.

The research projects of the Ilmenau Technical College are making an active contribution to fulfillment of the Ninth Party Congress resolutions, the main ones of which follow (4):

The conception on the accelerated development and application of microelectronics in the GDR economy;

The conception on the development, production and application of modern electronic control systems;

The development, production and application of industrial robots;

The employment of modern computer technology for the rationalization of information-processing processes and the more effective organization of production.

Scientists and students at the Ilmenau Technical College are aware that the mastery of microelectronics will essentially revolutionise present-day technology by saving on jobs, material and energy as well as by improving the quality and use characteristics of products.

To sum up, we can say that experience shows that especially where the accomplishment of complex sets of objectives for industry is concerned, the college's scientists and students are being called upon to figure out and formulate underlying theoretical questions, as well as to work out theoretically based solutions, and to bring them within a certain period to a practical conclusion that blends in organically with the overall solution. The department and the college are faced with a substantial task of management in acknowledging and constantly supporting such objectives on the basis of the department's scientific profile and in close cooperation with industry. The process of accomplishing these objectives provides the opportunity for comprehensive collaboration by scientists from different disciplines. Multifaceted cooperation like this raises the theoretical level and the practical effectiveness of scientific work and promotes many and varied uses of scientific findings.

A scientific lead is an indispensable prerequisite for informational progress and scientific-technical progress. But particularly under present-day conditions of the intensified class conflict in the field of science and technology, every graduate and engineer is obligated to perform his task on schedule and at a high level of scientific quality, to clearly recognize his relation to society, to emphasize the economic and social consequences of his findings and to strive for their application. It is in the molding of such character traits that our responsibility lies as educators and college teachers of socialist engineers, always keeping in mind that our own example is still the best educator.

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AERIAL PHOTOGRAPHY MONITORS CROPS

Budapest MAGYAR MEZOGAZDASAG in Hungarian No. 2, 9 Jan 80 p 1

[Article by Dr. Istvan Ban, deputy section head, Center for Plant Protection and Agricultural Chemistry of the Ministry of Agriculture and Food Industry: "Aerial Photography in the Service of Plant Production"]

[Text] Ten years ago, the biometric group of the Quarantine Laboratory for plant protection started to examine how aerial photography could be applied for the purposes of plant protection.

The bioelectrical potential distribution measured on plants enable us to follow up the energy state of plants and its changes caused by external effects. We examined the changed spectral distribution of the reflected radiation with a known spectral distribution radiation, incident on the plant, because data yield basic information which may be of interest for remote observations. The changes detectable by electron-microscopic examination indicate the deviations from the spectral distribution.

METHODS OF AERIAL PHOTOGRAPHY

Depending on the nature of the task at hand, we carried out our aerial observations between broad limits of altitude.

We were not able to make good aerial observations with a fixed-wing airplane below 500 meters (the relative velocity was too high); therefore, in cooperation with the air service of the Ministry of Agriculture, and Food Industry, we developed a method of aerial photography, and an aerial infra-red observation based on a KA-26 type helicopter for low level aerial observation; in the course of this activity, we made important aerial observations of interest for plant protection, agricultural chemistry and other specialized fields (mapping, geology, archeology, hydrology, environmental protection, hydrobiology, forestry, etc) using a non-measuring manually held camera, a measuring Wild RC camera and AGA Thermovision. The high hourly cost of the helicopter forced us to find a more reasonable method for aerial observation. In cooperation with the Hungarian Home Defense Federation, we developed a radio-controlled model-airplane-based method of aerial photography. The aerial camera installed in the model plane, radio-controlled from the ground, yielded high-quality aerial pictures which satisfied the practical requirements.

THE DETECTION OF INFECTIONS

In the course of the detection of infections for each plant culture, we examined the possibility of carrying out the detection by means of aerial photography; some of the results are given below.

While attempting to detect the blight Phytophthora infestans from an altitude of 50 meters, in the course of the interpretoscopic examination of Kodak Ectachrome MS transparencies prepared by a Wild RC-8 camera, using a KA-26 helicopter, it was found possible to differentiate quite well the dark green-colored healthy potato plants, while, depending on the level of the infection, the infected plants exhibited a light green, yellowish-green, yellowish and brownish coloration. The plants attacked by the potato beetle could also be identified.

On the Kodak Ectrachrome MS stereoscopic pairs of transparencies, taken with a Wild RC-8 camera from a KA-26 helicopter from an altitude of 270 meters, examined by means of an interpretoscope, to detect the Phodosphaera leucotrichal infection, it was possible to recognize the infected sprouts, the twisted leaves and the bare ends of the sprouts (candles).

While trying to detect Gnomonia erythrostoma in an apricot orchard on Kodak Ectrachrome MS transparencies, taken with a Wild RC-8 camera from an altitude of 60 meters from a KA-26 helicopter, the diseased trees could be detected with an unaided eye.

In the detection of the peronospora grape mildew (Plasmopara viticola) on Kodak Ectrachrome MS transparencies taken with a Wild RC-8 camera from an altitude of 20 meters from a KA-26 helicopter, the vivid green healthy vine stock could be differentiated from the contaminated yellowish-green, yellowish, brownish leaf sections, which indicated the level of the infection.

One of the chief tasks of the helicopter-based aerial photography was to detect the deterioration of corn at Babalna. On the Kodak Ectachrome MS color transparencies, taken with a Wild RC-8 camera from an altitude of 200 meters from a KA-26 helicopter in the course of this study, the healthy green and light-yellowish-green corn, suffering from metabolic problems and the mouse-green, completely dead spots could be well differentiated with the unaided eye.

The densitometric examination and the subsequent mathematic evaluation of the obtained see-saw sets of the aerial-photographic transparencies of the infected and healthy plant cultures made it possible to differentiate between the healthy and the contaminated spots of plants.

We studied the possibility of detecting the infection by developing a remote infrared observation technique, carrying out the observation by means of AGA Thermovision from a KA-26 helicopter; the potato spots infected by phytophthora infestans could be recognized on the screen of the instrument from an altitude of 50 meters, but they could not be identified on the black-and-white pictures taken from the screen. An observation from an altitude of 100 meters revealed the spots infected with the yellow mosaic virus of the group on the screen of the instrument.

On the basis of the ease of evaluation of the 56 x 72-mm aerial pictures taken from the helicopter with a Linhof camera, we found that we could use small aerial pictures to detect plant diseases. After we developed the radio-controlled, model-airplane-based aerial photography, we were able to carry out the detection of the infection by using a model airplane.

During the observation of the damage to corn at Babolna, we took very high quality aerial pictures on ORWOCHROM-UT 18 color-transparency and 20-DIN black-and-white film, using a radio-controlled robot camera from altitudes ranging from 20 to 400 meters. The damaged corn spots can be easily seen on the magnified projection of the 24 x 24 mm pictures. It was found that a height of 50 meters is the optimum altitude for taking the pictures.

THE STATE OF THE SOIL CAN ALSO EASILY BE DETECTED

In the field of agricultural chemistry, aerial photography yields useful information, in the first place as a tool to improve the soil and the nutrient supply. Aerial photographs are useful for the preparation of terrain surveys for soil-improvement plans. In addition to facilitating the orientation, they yield information on the relief relations, the various natural plant clusters (growth of reeds, etc) the state of the ground surface, the location of the water table, the degree of erosion, the location of eventual ground faults and spots of cultivated plants suffering from strongly retarded development. Field surveys and mapping may be replaced to a large extent by the spatial evaluation of identified aerial pictures.

Spots of plants suffering from nutrient defficiencies or overfertilization may be detected not only be infrared film, but also by conventional color film. Evaluation by aerial photography of the distribution of the various brown spots within one block also yields useful information for planning the supply of nutrients.

Estimation by aerial photographs of the cultivation areas removed from production, the degree of deterioration and the state of development of the plants, allows to make a preliminary forecast of the expected yield.

The colorimetric determination of the brown spots in color and color-infrared pictures taken by aerial and satellite photography in the course of experimental studies allowed to determine the humus and lime contents.

INFRARED PHOTOGRAPHY FOR PLANT PROTECTION

Its first application for plant protection was the examination of corn sprouts infected by Helminthosporium. The various infection phenomena could be distinguished on the pictures. Later on, we experimented with 35-mm Kodak Ectachrome infrared 2235 film. We made pictures of areas with water tables, fruit orchards and vinyards from a KA-26 helicopter, from altitudes ranging from 50 to 400 meters, using a hand-held camera and infrared film. The water table areas and the wet ground spots stood out sharply on the pictures. Depending on the degree of the infection, the healthy red plants became darker and darker, all the way to dark-brown coloration. The individual tree types and soft-stem plants appeared in varying tones of red in the infrared photographs. The pictures taken from an altitude of 800 meters by other institutes with a measuring camera, using Kodak Aerochrome Infrarouge 2443 film, which are being evaluated at the Center for Plant Protection and Agricultural Chemistry, of the Ministry of Agriculture and Food Industry, present a similar gamut of colors; for example, the acacia tree is vivid red, the poplar tree is a somewhat darker red, and the corn is vivid red.

The satellite pictures and their varying shades of coloration (from a scale of 1:1,000,000 to a magnification of 1:20,000) yield a very useful overview about the relief features, geographic characteristics the degree of pollution of our surface waters, the direction of the subsurface water currents and the vegetative cover of our country and the surrounding areas.

We started to study the possibility of identifying plant species by means of colorimetric measurements of color and color infrared pictures taken with aerial and satellite cameras. Some of the plant species could be definitely identified by determining the color coordinates; on the other hand, the determination of other plants remains uncertain.

There is no ground-based information in our country needed to compare the results of aerial and satellite observations. However, I believe that this question may be resolved by developing the system in the following manner.

Several institutes in the country are developing, independently from each other, large, computer-based registry systems at the same computer center, namely at the ASZSZ computer center of the Central Statistical Office, using WHB 66/60-type computer. Thus, the Ministry ofAgriculture and Food Industry is responsible for the system of the National Council for Land Redistribution,the Cartographic Enterprise for the land cadastry system, the Forestry and Wood Industry Branch of the Ministry of Agriculture and Food Industry for the forest registry system, and the Center for Plant Protection and Agricultural Chemistry of the Ministry of Agriculture and Food Industry for the Agrochemical Information and Control system.

By using a common identifier, these systems could be made to correspond to each other mutually and unambiguously. Such a coordinated effort during the development stage would allow to create a more convenient and less expensive system than starting the coordination years from now. This large system would contain all important cadastry, ground cover, forestry, agronomic, economic, plant cultivation, developmental, relief, soil-science and meteorological data of Hungary. This would represent a very useful information system for the national economy also. One of its minor functions would be to serve as the basis of comparison at the ground level for the information data base obtained by aerial and satellite observations. This would solve to a large extent the difficulties of comparability at the ground level.

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POLISH ACADEMY OF SCIENCES ACTIVITIES, PERSONNEL

Warsaw NAUKA POLSKA in Polish No 7, Jul 79 pp 123-127

[Excerpt] Seminar of Economists in Zakopane

A research-study team of the Institute for Prognostic Theory of the Economics Academy in Krakow organized an all-Poland seminar of economists on 6-7 April 1979 in Zakopane to discuss the topic: "Methods of Selecting Variables in Econometrics Models."

Researchers from economics institutes and the universities of Gdansk, Katowice, Krakow, Lublin, Lodz, Poznan, Warsaw and Wroclaw participated in the sessions. The problems which were discussed are of great significance practically, since they are linked with the prediction, the direction and modeling of economic processes.

The Quality of Life and Work

The Central Council of Trade Unions organized a conference on 2-3 April 1979 in Jachraniec near Warsaw with the theme: "The Quality of Life and Work and the Workers' and Trade Union Movment." Scholars and state functionaries, together with social workers and trade union officials took part in the conference. The program consisted of 25 papers, which served as the basis for discussion. Discussion of these papers was chaired by the following: Assistant Professor Tadeusz Stepien--a definition of the quality of life and its standards; Assistant Professor Urszula Libura--socioeconomic conditions for the quality of life; Assistant Professor Kazimierz Ryc--means and goals of social policy in socialist countries; Assistant Professor Tadeusz Jaworski--the activity of trade unions for improving the quality of life and work.

The following were among those who took part in the discussion: Professor Jan Szczepanski (acting member of the Academy of Sciences) and Professors Antoni Rajkiewicz, Bronislaw Oyrzanowski, Remigiusz Krzyzewski. The participants noted the close connection between the quality of life and the quality of work; the existence of a definite egalitarianism in the aspirations of social classes and levels, among the intelligentsia, workers, peasants and the like, was emphasized.

Socialist Economic Integration

In conjunction with the marking of 30 years of activity of CEMA, the Institute of Foreign Trade Fluctuations and Prices in Warsaw and the International Institute of Economic Problems of the World Socialist System in Moscow organized an international scholarly conference from 10-12 April 1979 to study questions of the theory and practice of socialist economic integration. Fifty-five scholars from the CEMA countries participated in this conference. The sessions were divided between two topics: general problems of socialist integration and forms and methods of economic cooperation.

The goal of the conference was to amass the opinions of outstanding specialists about the real problems, difficulties and perspectives of socialist economic integration. The discussion, in which 44 persons participated, was centered around such problems as: the key problems of integration, for example, the intensification of specialization and co-production ties; cooperation in the area of raw materials; questions of the development of mutual trade exchange and of coordinating plans. The realization of perspective and directional problems of cooperation was evaluated, as was the progress which has been made toward perfecting the exchange-financial system of CEMA nations. Questions of broadening the economic cooperation of CEMA nations with other countries were discussed. Zdzislaw Kurowski, PZPR Central Committee Director of the Division of Light Industry, Trade and Consumer Goods, noted the close connection of theory and practice for resolving the most essential problems in the further development of mutual cooperation among CEMA countries. Professor Pawel Bozyk, Director of the team of scholarly advisors to the PZPR Central Committee first secretary, described the place of Poland in the process of socialist integration.

Materials and proposals from the conference will be utilized in the execution of proposals suggesting ways for streamlining the progress of integrative processes.

Seventh International Symposium of Chemists in Lodz

The 7th International Symposium was held from 27-29 March 1979 in Lodz with the theme: "Processes of Polycondensation." Polycondensation is one of the fundamental methods for deriving polymers which are widely used in the production of synthetic textiles.

The symposium was organized by the Institute of Synthetic Textiles and the Institute of Polymers of the Lodz Polytechnical School; a group of researchers from the Academy of Sciences collaborating to solve the crucial problem of "Multimolecular Links"; the Lodz division of the Polish Academy of Sciences and the Polymers Commission of the Committee for Chemical Research of the Polish Academy of Sciences.

Approximately 100 researchers from Bulgaria, Czechoslovakia, the GDR, Poland, Hungary and the Soviet Union took part in the sessions. Nineteen papers and 19 bulletins were presented summarizing and evaluating the results of research into polycondensation processes to date and delineating new directions for further research ventures and efforts.

Participants in the symposium toured the Lodz Polytechnical School and familiarized themselves with the collections of the Museum of the Textile Industry and the Museum of Contemporary Art.

Research Work in Outer Space

A meeting of scientists from the Center for Cosmic Research of the Polish Academy of Sciences and from the M. Copernicus Astronomical Center [CAMK] in Warsaw with the Polish cosmonaut Lt Miroslaw Hermaszewski took place on 29 March 1979 in Warsaw.

The subject of the meeting was a discussion of the progress of research work undertaken in outer space by the Soviet-Polish crew of "Sojuz 30," specifically: the operation of the technical systems of the space station "Salut 6," especially those systems which were utilized during experiments prepared by Polish research institutions. Those taking part in the meeting were astronomers and specialists who described Polish research and experiences in outer space. At the conclusion of the meeting, Lt Hermaszewski presented both the Director of the Polish Academy of Sciences Center for Cosmic Research, Professor Stanislaw Grzedzielski and the Director of CAMK, Professor Jozef Smak with facsimile copies of "On the Revolution of Heavenly Bodies" from the works of Mikolaj Copernicus signed with the autographs of all the members of the crew of the space team "Sojuz 29--Salut 6--Sojuz 30" and imprinted with the postmark of the outer space post office "Salut 6," as well as miniature flags of Poland and the USSR.

Poland's Share in Scientific Research of Outer Space

On the occasion of the annual "Gagarin Days," coinciding this year with the 10th anniversary of the naming of the Zielona Gora Higher School of Engineering for Yuriy Gagarin, a scientific symposium was organized in Zielona Gora for 11 April 1979 having the theme: "Poland's Share in Scientific Research of Outer Space."

Among the lectures composing the program of the symposium were presentations on the following topics: research in the area of cosmic medicine, technological experiments in outer space, research studies of Earth from orbit and achievements of Soviet cosmonauts. An honored guest participant in the sessions was the first Polish cosmonaut, Lt Miroslaw Hermaszewski, who offered his impressions of the Polish-Soviet flight into the earth's atmosphere.

Jan Rychlewski, corresponding member of the Polish Academy of Sciences and head of the Committee for Cosmic Research of the Academy of Sciences chaired the sessions.

In conjunction with the symposium, a display demonstrating the scientific output of the Higher School of Engineering in Zielona Gora was open to viewing.

Conference of Nuclear Physicists in Krakow

From 24-26 April 1979, the 13th conference of research-specialists in nuclear physics from institutes in Kiev (USSR), Rossendorf (GDR), Rez (Czechoslovakia) and Krakow was held in Krakow. The purpose of the sessions was the exchange of experiences in solving scientific problems using similar research equipment available both in Poland and in neighboring countries.

Sixth Polar Symposium

The Institute of Geography of Lodz University organized the 6th Polar Symposium, which took place from 27-28 April 1979 in Burzenin, Sieradz Voivodship. Members of the Polar Club participated in the sessions. This Club, which has been in operation since 1974, was organized by the Polish Geographic Society. Among those present were researchers who had carried out scientific experiments at the North and South Poles, as well as: advisor for scientific affairs of the French Embassy in Poland Vincent Collet; geomorphologist from the University of Leningrad Professor D.B. Malakhovskiy, known for his research on the North Pole; ornithologist from New York University Professor Nicolas Volkman; Polish scholar of polar problems, corresponding member of the Polish Academy of Sciences Alfred Jahn.

Papers and progress reports of scientific-research expeditions were presented. Progress in the area of solving the difficult problems encountered by travelers to the far north was evaluated; experiences which may serve to further advance the research work of Polish polarists were related. Participants in the sessions viewed films taken during experiments on the above expeditions.

A display was organized in conjunction with the symposium to show, among other things, the zoological and geological exhibits, as well as the flora issuing from the North and South Poles.

Radio and Microwave Spectroscopy

The Institute of Molecular Physics of the Polish Academy of Sciences in Poznan organized an international conferednce "RAMIS-79" (Radio and Microwave Spectroscopy) in Poznan from 24-27 April 1979 with the topic of radio and microwave spectroscopy. Approximately 150 persons from every scientific center in Poland, together with 20 distinguished specialists in this area from England, Greece, Yugoslavia, the GDR, Norway, the FRG, Romania and the Soviet Union participated in the conference.

The president of the European group of specialists in spectroscopy, Professor E. R. Andrew (England) gave the opening address. Among his subjects was the application of spectroscopy in medicine, for example, x-raying the body by means of nuclear resonance. Participants in the sessions became aware of the output of the Poznan Institute of Molecular Physics of the Polish Academy of Sciences and viewed a display of our research apparatus in this area of knowledge.

Proof that the achievements of the institute have been recognized is that it has been entrusted with the organization of the 12th World Congress on spectroscopy in 1982.

Progress in Machine Cutting

The Institute of Machine Cutting in Krakow, celebrating the 30th year of its work, organized the 5th International Conference devoted to an evaluation of output in the development of theory and techniques of machine cutting in Poland and in the world up to the present time. The conference took place from 19-21 April 1979. Approximately 250 researchers from technical institutes and schools, representatives from industry and specialists from Bulgaria, Czechoslovakia, the GDR, Hungary and the USSR participated.

Participants in the sessions also included: scientific secretary of the Polish Academy of Sciences, acting member Jan Kaczmarek, Doctor of Engineering Aleksander Kopec, minister of the machine industry, and secretary of the PZPR Coordinating Committee Stefan Markiewicz.

Questions of Optimalization in the Power Industry

In Gdansk from 19-21 April 1979 a symposium dedicated to problems of optimalization in the power industry was organized in honor of the 75th birthday and the 50th year of scholarly endeavor of Professor Kazimierz Kopecki, specialist in the area of the power industry, doctor honoris causa of the Gdansk Polytechnical School.

The rector of the Gdansk Polytechnical School, Professor Marian Cichy presented a paper summarizing the output of Prof K. Kopecki. Following this, the first secretary of the PZPR City Section Committee in Gdansk, Tadeusz Fiszbach offered his congratulations to Prof Kopecki as well as words of recognition for his part in the development of science and economics in Poland and for his fruitful sociopolitical work. Professor Kopecki, in turn, offered his reflections on his many years of scholarly pursuits and on his educative work with several generations of students.

In the discussion, which was carried on in several problem groups, several scores of specialists from home and abroad expressed themselves on topics connected with the development and the exploitation of power industry systems.

A Symposium on the Chemical Carbonization of Coal in Katowice

Under the sponsorship of the Coal Committee of the European Economic Commission [EKG] of the UN, the 2d International Symposium was organized in Katowice from 23-27 April 1979 with the theme of the gasification and liquefaction of coal. More than 450 distinguished specialists from 24 countries as well as experts from numerous international economic organizations took part in the symposium.

The opening paper was given by Minister of Mining Wlodzimierz Lejczak, who discussed the efficiency of the processes of gasification and liquefaction. Following this, a representative of the executive secretariat of the UN EKG, Arthur M. Stillman, emphasized the serious output of Poland in the development of mining and the coal industry on a world scale, and especially the role of Poland in the labors of the Coal Committee of the EKG, the head of which is the Pole, Dr Zygmunt Wegrzyk.

During the symposium, 13 collective papers and 70 individual presentations were given. These were grouped around four fundamental topics: the role of the gasification and liquefaction of coal in improving the efficiency of the use of energy; progress and the directions of development in the technologies of gasification and liquefaction of coal; coal as a source of chemical raw materials, and protecting our environment in the processing of coal. The goal of the sessions was an international exchange of ideas and experiences in the area of the gasification and liquefaction of coal and an explanation of the tendencies emerging in this sphere, and also a summarization of the progress that has been achieved since the first meeting of specialists in Dusseldorf in 1976. It was also an opportunity for cementing contacts between specialists working in this field in various countries. The foreign participants in the sessions became acquainted with the work of Polish centers involved in the processing of coal; they paid a visit to the Chemical Carbonization Institute of the Main Institute of Mining and to the Institute of the Chemical Processing of Coal.

As a result of the sessions, a document including recommendations to the [illegible] EKG was agreed upon. This document states that, in the face of the existence of progress in researching the various technologies of the chemical carbonization of coal, of the improved efficiency of this research and the increasing "purity" from the point of view of protecting the environment, the processing of coal into gas, liquid fuels and raw materials for the chemical industry is more and more attractive economically.

During the symposium a display of the achievements of Polish mining was open in the Center of Technical Progress in Katowice.

Management Efficiency

The Engineering-Economics Department of Transport of the Szczecin Polytechnical School organized a conference from 25-26 April 1979 dedicated to the problems of the growth of management efficiency. Scholars from the whole country participated in the conference.

Many papers treated of the most important directions and ways leading to the growth of management efficiency of human resources, fixed assets and working capital. Such topics as an econometric analysis of thrift, problems of the efficiency of technical and organizational progress, specialization and co-production as factors in increasing the efficiency of industrial production, making use of cost factors in the analysis of economic activity, and methods of economic estimation in the planning of carrying cargo by automobile transport were discussed.

Structural Changes in Farming

The Institute of the Fundamental Problems of Marxism-Leninism of the PZPR Central Committee in Warsaw, with the cooperation of the Agricultural Academy in Krakow and the PZPR Voivodship Committee in Tarnobrzeg organized a conference from 26-27 March 1979 in Baranow Sandomierski with the theme of the structural changes which have occurred in Polish farming. This theme is part of a whole complex of studies relating to the socioeconomic reconstruction of the village and of farming coordinated by the Marxism-Leninism Institute.

The conference was one of the stages in the efforts to summarize research to date and was also an opportunity for a confrontation of theoretical papers with the practical problems of agricultural development in the southwest region of Poland. Participants in the sessions, besides scholars and representatives from 24 research centers from the whole country and from central institutions for agriculture, also included representatives of voivode party units from Lublin, Radom, Rzeszow, Tarnow and Tarnobrzeg.

The following papers were presented: "The Socioeconomic Development of the Country and the Shape and Alterations of Agrarian Structure" (Augustyn Wos); "Changes in Agrarian Structure in Regions With a Predominance of Parceled Peasant Farms" (Franciszek Kolbusz); "Legal Instruments of Farm Policy and Their Influence on Changes in Agrarian Structure" (Andrzej Stelmachowski); "Changes in the Utilization of Land: an Analysis of Data and an Attempt at Prognosis" (Anna Szemberg); "The Influence of Extra-agricultural Work of the Peasant Population on Changes in Agrarian Structure" (Stanislaw Moskal); "The Role of Farm Cooperatives in the Structural Transformation of Agriculture" (Boleslaw Struzek); "Changes in Agrarian Structure in Regions With a High Rate of Socialized Agriculture" (Leszek Wisniewski); "Social Changes in the Process of the Reconstruction of the Village and Agriculture in Poland" (Wlodzimierz Dzun); "Directions of Structural Changes in Regions of Parceled Farming, on the Example of the Tarnobrzeg Voivodship" (Wlodzimierz Sokola); and "Transformations and the Development of Agriculture in the Opaty Rural Commune" (Lech Boran).

Materials presented during the conference will be published in book form.

Conditions of the Development of Grain Production

A scholarly-technical conference on the topic of the conditions and factors favoring the development of grain production was held in Sieradz on 11 April 1979. The Association of Engineers and Technicians of Agriculture organized the conference.

The program for the sessions included papers and discussion. Professor Marek Ruszkowski (Institute of Cultivation, Fertilization and Soil Science in Pulawy) spoke on the conditions and factors affecting the growth of the production of grain in Poland; Professor Kazimierz Mickum (Central School of Agriculture of the Agricultural Academy in Warsaw) presented the economic-organizational conditions and factors of grain production in Poland; papers concerning the realia of the Sieradz Voivodship and problems of grain production there were presented by Engineering Professor Roman Szymanderski (substituting for the director of the Voivodship Center for Farm Progress in Inczew) and by Engineering Professor Henryk Jasinski (director of the Station for Preserving the Evaluation of Change in Maslowice).

The Use of Thermography in Medicine

The first All-Poland Symposium dedicated to the use of thermography in medicine was held in Poznan from 9-10 April 1979. In addition to specialists from all the larger medical centers in the country, participants in the symposium included representatives from research institutes in Czechoslovakia, France, the GDR, Italy and the USSR, as well as representatives of foreign companies producing thermographic equipment.

Methods for Studying the State of Human Health

The 3d Scientific-Coordinational Conference of specialists of the member nations of the CEMA was held in Warsaw from 10-12 April 1979. The conference was called for a joint deliberation of the problem: "Complex Methods of Researching the State of Human Health." The following delegates took part in the conference: Dr T. Cholakova, PhD of Bulgaria, director of the research team; Professor E. Makovicky of Czechoslovakia; Professor F. Rojas of Cuba, Dr J. Otto, PhD of the GDR, Professor J. Balog of Hungary; Dr A. Romenskiy, PhD of the USSR, as well as a representative from the Department of Health of the CEMA Secretariat, Dr D. Bateuch. Poland was represented by: Professor S. Miekodaj and Assistant Professor S. Klonowicz, PhD of the Tuberculosis Institute in Warsaw; Assistant Professor F. Sawicki, PhD of the State Institute of Hygiene in Warsaw; Professor J. Indulski of the Institute of Industrial Medicine in Warsaw; W. Matuszkiewicz, MD of the Institute of Social Medicine of the Medical Academy in Lodz.

The initial results of cooperation in the area of the complex research of the state of human health from 1977, and the directions of joint research for the years 1981-1985 were the topics of discussions.

Ten Years of the International Laboratory in Wroclaw

April 1979 marked the 10th anniversary of the existence in Wroclaw of the International Laboratory of Strong Magnetic Forces and Low Temperatures, a center which serves several CEMA countries--the USSR, the GDR, Bulgaria and Poland.

From the time of its inception the center has been directed by Polish Academy of Sciences member spokesman Wlodzimierz Trzebiatowski. The Scientific Council, on the other hand, which is composed of two representatives from each academy, oversees research and budgetary matters. From its beginning the head of the council has been corresponding member of the USSR Academy of Sciences N. E. Alekseyevskiy. Most of the research in the center is done by Polish physicists. Research in the laboratory is also carried on by scholarship students from the other three countries. Beyond this, much research is carried out jointly by international teams.

The scientific work of the laboratory is divided basically into four areas. These are: superconductivity, magnetics, mechanisms for conducting current through metals and the designing of new magnets. The output of the center up to the present time has fully met the expectations with which it came into being. Besides the center at Dubna, it is the second example of this type of center which integrates the efforts of scholars from several countries and brings about concrete, measurable effects.

"The GDR Science and Engineering Days in Poland"

From 23-28 April 1979 "The GDR Science and Engineering Days in Poland" were held in Poland. On this occasion, many events were organized with the purpose of familiarizing scientists, engineers, economists and representatives of foreign trade with the achievements of the GDR and with the possibilities of cooperation in the fields of science, engineering and economics.

From 23-25 April, the 17th Session of the Committee for Economic and Scientific-Technical Cooperation between Poland and the GDR was held in Warsaw. Vice Premier Gerhard Weiss led the GDR delegation; Vice Premier Jan Szydlak, the polish delegation. Progress in mutual relations in the domain of cooperation was evaluated and the perspectives for further cementing economic and scientific-technical connections between the two nations were discussed.

In Bydgoszcz, Gdansk, Katowice and Lodz, both in scientific-research centers and in industrial institutes, lectures were organized on the theme of the results achieved in the area of new technical constructions and modern products in the GDR, as well as the most practical developments in the domain of housing, communal and industrial construction, the production of instruments for microelectronics, protective coatings and the like. The lectures were often illustrated with slides.

After more than a dozen years of effort, "The National Atlas of Poland" appeared in its completion in April 1979 (see the note concerning parts I and II in the "Chronicle," No 5, 1974 p 197). The atlas is a large cartographic encyclopedia of Poland. On the 634 maps, executed in 24 colors (at a scale of 1 : 2 million) and the 110 charts and diagrams, are portrayed the natural topographic conditions of the country, and against this background, economic activity and progress, cultural development, demographic changes and the social problems of contemporary Poland.

"The National Atlas of Poland," for which the head of the State Council, acting member of the Polish Academy of Sciences, Henryk Jablonski wrote the introduction, is the combined efforts of a team of over 100 scholars under the general direction of acting member of the Polish Academy of Sciences Stanislaw Leszczycki. As Dr Michal Najgrakowski, speaking for the general editor of the atlas in an interview granted to TRYBUNA LUDU (30 April 1979) stated: "His task is to give a universal picture of Poland in the sphere of knowledge of the cultural environment as well as of the socioeconomic development. Unfortunately, we have a picture from 1970. We must admit, however, that cartographic publications become outdated at a significantly slower rate than statistical data. The purpose of the map is not to present these data, but to point out the relationship between individual geographical, social and economic phenomena. The dynamics of industrial development is not synonymous with the same rate of the dynamics of change in the make-up of the bringing of land into cultivation countrywide."

"The National Atlas of Poland" is intended both for specialists studying problems of territorial planning and for the great mass of literate Poles who wish to learn about their country.

The atlas was executed in the Cartography Workshop of the Geography Institute of the Polish Academy of Sciences. Reproductions were executed by the Military Cartographic Institute in Warsaw. The publisher is the National Institute named for Ossolineum of the Publishing House of the Polish Academy of Sciences.

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PREPARATIONS FOR MAKING NUCLEAR TECHNOLOGY EQUIPMENT

Bucharest SCINTEIA TINERETULUI in Romanian 22 Dec 79 p 3

[Article by Pavel Perfil]

[Text] Romania, producer of equipment for nuclear power plants. Who could have said that 10-15 years ago? Romania, striding firmly along the path to its own energy independence. Who would have believed, not long ago, that the 1981-1990 period would see the fulfillment of this condition? Two decades ago it would not have been possible to discuss domestic nuclear equipment, nor an extensive struggle to achieve our own energy independence, for a very simple reason: the material basis was lacking to achieve such an ambitious goal. We did not have, for instance, a unit such as the Bucharest Heavy Machinery Enterprise (IMGB), nor powerful centers for specialized research and design. But now, the Directives of the 12th Congress set the task of building a 660 MW nuclear power plant by 1985. Naturally enough, the task is addressed to electric power plant builders, but in this case it is also aimed primarily at machine builders, at the future manufacturers of nuclear equipment. That means the old and young people at IMGB. This is now the focal point of this vast project, the place where the most ambitious -- and most peace-oriented -- designs begin to come to life, to generate a new qualitative leap in the organization of labor, in the professional development of young people, in their approach to mobilization and action.

"We have started to prepare the fabrication of nuclear equipment," states Serina Terzian, nuclear plant engineer, one of the young people who are now jumping on the bandwagon of success. "The work is Herculean and unusual. We design with new dimensions and tolerances, and we demand higher levels of accuracy from the fabrication sectors. We also ask for technical processes which have never been used in the country. Do you realize what that means? First of all a reassessment of each one of our professional qualifications, and then the conception and fabrication of technical equipment with outstanding characteristics, which also do not exist in other enterprises in the country. And thirdly, the rapid completion of investment projects for future equipment manufacturing capabilities. As you can appreciate, these tasks are not at all easy, and all the young people like me are aware of it. That is why we try to improve our approaches, the framework of our efforts, and the possibilities for introducing and exploiting initiative."

This is not only the opinion of the young engineer Sorina Terzian. It is also supported through deed by her colleagues, technologists Sorin Draghici and George Vultur, by the builders at ICSIM (Enterprise for Special Industrial Constructions and Installations) Site 2, by equipment installers, and not least, by the builders of today's turbogenerators, those who will provide a large part of the future nuclear equipment. "We have organized qualification improvement courses for those who will work in the new areas," we were told by Puiu Ilie, secretary of the UTC (Union of Communist Youth) committee for the enterprise. "At the same time, those who take the courses also participate in the installation of the new high performance equipment so that they may learn on the spot and in detail, the 'secrets' of their new activities." Alexandru Taraivan, member of the enterprise's UTC committee, had this to add: "Not only do they work on the installation of this equipment, but they also effectively contribute to its construction. Many of them are part of the special teams which brought to completion our organization's contracts with the enterprise. That is how we built the holding fixtures for the 12,000 tf and 6300 tf presses, the grill for the Verina thick plate roller, and so on. The manpower value comes close to a million lei, which is far beyond our obligation for this year."

The most recent accomplishment of the young people is another subassembly for a high precision machine: the roller bed for non-destructive control at the Seleas installation. It is the last contract for the year, and it was naturally completed ahead of time. It will be followed by others, at least as complex, as we are assured by engineer Victor Ostropel, of the production department. "The experience we have had with contracts this year has convinced us that the special youth teams do good work. And at times, out of competition, they even do better work than experienced collectives."

It is not only those in mechanical processing who encounter particular problems in connection with the fabrication of nuclear equipment. Metallurgical departments will have to formulate absolutely new materials which will impose other techniques for thermal treatment, welding, destructive and non-destructive testing, and even the handling of assemblies and subassemblies. Tolerances of the order of microns will be expected for parts that weigh tens of tons. Precision levels will be even higher than those established during the fabrication of the 330 MW turbogenerators. "Qualification improvement courses have been opened for steel workers, heat treaters, welders, and quality controllers," says the secretary of the UTC committee. "More than one thousand young people in the enterprise are now upgrading their theoretical and practical knowledge, and their professional positions and competence. In several years, when we report the completion of the first Romanian nuclear equipment, we will also note a spectacular qualitative jump in the professional training of the young. The fabrication of this equipment is in fact a call to all the personnel and all young people, to reach this maximum level of training, necessary to sustain such a collective effort."

Up to that moment of success, a long road still has to be covered. The workers of engineer Dumitriu, at Site 2, still have to complete the heavy mechanical welding shop, and together with the user, to finish installing first the 12,000 tf press, and then the 6300 tf one. As general contractor, IMGB has fulfilled its obligation, but is still behind schedule in preparing the start of the huge press. It is now expected that this will take place in the next few weeks, concurrent with the completion of the welding shop and with the beginning of equipment installation in this shop. However, this optimism remains an unsupported sentiment, as long as these hot spots do not also find themselves the focuses of a maximum concentration of forces on the part of both the user and the builder, so as to honor the obligation that was undertaken: the large press in the heavy forging shop must be placed in operation during the first days of the new year. With this, the preparation for the fabrication of the future Romanian nuclear equipment will enter the path of maximum effort, a path which it can be said, will give birth to a new generation of heavy machinery builders.

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PLAN FOR BLACK SEA POWER PLANT DEVISED

Bucharest FLACARA in Romanian 13 Dec 79 p 8

[Interview with engineers Constantin Iulian, Petru Dan Lazar, and Dan Magdas, and with geologist Ion Lup, by Lionel Nitescu]

[Text] The first Romanian sea hydroelectric plant, which will put to use the energy of waves, has come to life! Its birth certificate is Patent No 66,305 -- "Procedure for Utilizing the Energy of Sea Waves" -- authored by Constantin Iulian, Virgilius Copaci, and Dan Magdas.

This first Romanian sea power plant was carefully tested in the laboratory with modern electronic instruments, by a group of competent and dedicated specialists.

The first Romanian sea power plant is now awaiting its confrontation with nature. We hope that it will not have long to wait, especially since many countries in the world -- Japan, England, West Germany, France, Australia, India, the United States, Norway, Spain, Canada, and others -- are now reaching the practical construction phase. Why not here as well? We have waves, we also have a growing demand for power, and along the 200 km of Romanian shoreline, "the waves, the winds" evoked by the poet Eminescu are a source today not only of poetic inspiration, but also according to the calculations of the patent holders, the possible sources of some two billion kWh/year, which is the equivalent of about four Bicaz hydroelectric plants. And that's not all: the same sea power plant -- more exactly a string of such plants -- could at the same time exploit the available solar and wind power. While seeming to skirt science fiction, our talk with engineers Constantin Iulian, Petru Dan Lazar, and Dan Magdas, and with geologist Ion Lup, actually brings us into today's real world, and opens a window to the future, toward wondrous artificial islands in the Black Sea, islands to capture energy.

[Question] Are there other patents similar to yours?

[Answer] Very few people are aware that the first Romanian patent application for the exploitation of wave energy was made 60 years ago, and that since then, 40 other applications were received by the State Office for Inventions and Trademarks, none of which met acceptance criteria. Patent No 66,305 is thus the first one of its type here. It is also unique throughout the world, a reason for which the patent was granted (absolute novelty constituting an indispensible condition), another being the fact that it was conceived and designed specifically for our coast. The majority of the foreign projects are intended for more violent seas with large waves. Japan and England, for instance, are interested in ocean waves. The Black Sea is relatively calm, with most of its agitation occurring in January; as a rule, the waves never exceed one meter in height. Nine meter waves were recorded during very large storms, such as in the winter of 1962, but our calculations were not based on such exceptional conditions. We have sought to refute the opinion that the Black Sea waves did not have the amplitude and frequency to make them useful for power production.

[Question] What is the basic idea of the patent?

[Answer] A procedure for collecting the energy of uncontrolled waves, using a small floating platform to couple directly to the vertical motion of the water. The motion is transmitted to a generator, which transforms it into an alternating current of unregulated frequency, which is turn used as a source of heat based on the well-known Joule effect. In order for the energy thus obtained to be sufficiently large and significant, we contemplate the installation of a front of sea hydroelectric plants along some 200 km of Romanian coastline. Laboratory studies have confirmed the principle from a qualitative standpoint, and quantitative measurements remain to be obtained during future field tests, conjugated with those in the laboratory. Detailed calculations show that for a total collection and conversion yield of only 25 percent, the potential generated power could reach two billion kWh/year.

[Question] Would these plants be placed close to the shore? And if so, would they not interfere with tourism and navigation?

[Answer] Let us answer these questions one at a time. Because the topography of the Black Sea bottom and its shallow slope lead to large losses of energy for waves in the so-called neutral boundary of the sea and the beach, we believe that the location of energy collection constructions in the immediate vicinity of the shore would be unreasonable. A favorable location would be beyond the freeze line, the more so since other technical considerations indicate a distance of 3-5 km from the shore.

[Question] You are highly qualified specialists. Your current professional efforts at the Hydroelectric Power Studies and Design Institute, where you work, involve highly complex technical problems concerning dams on the Olt, morphological changes resulting from the blocking of river beds, the hydro-technical and power complex Cerna-Motru-Tismania, and so forth. As professional men, you do not toy with figures and words. Your statements about the power potential of sea hydroelectric plants must therefore be taken seriously, be it only as a basis for discussion, as a starting point. To repeat then, would this project not harm the seashore tourism? And would the initial investment not be too high to be economically justified, even if it did present interest from a technologic and scientific standpoint?

[Answer] Our fundamental idea was for sea hyderoelectric plants to lend themselves to multiple usage; as a result -- and please remember this -- we are not concerned solely with wave energy, which is naturally random and depends on season and location.

These floating structures can accomodate wind and solar energy collectors, since under any given meteorological conditions the wind speed is higher at sea than on land, and since the collection of solar energy does not encounter the problems found on land: no agricultural land will be removed from production by the installation of solar collectors on the Black Sea! The cumulative utilization of wave, wind, and solar energies has proven to be more efficient than the separate use of each of them alone. Future sea plants will be able to also supply energy to plants designed to produce hydrogen (a future fuel) from sea water.

Because the floating structures act as a barrier to waves, they will reduce coastal erosion, and as shown in the specialized literature, will discourage the deposition of sand on beaches by redirecting toward deeper waters, the coastal current which -- especially during storms -- eats away at the submerged sand.

The still water lagoon that would be created between the collection front and the shore, could be used for various purposes, some of which would be of economic interest: aquaculture, navigation, water sports, recreation, and so on. Large sums are currently being spent to protect the coast against erosion, especially in the southern portion of the Romanian coastline, and to create and expand beaches in the Mangalia-Nord tourist area. Our project would thus encourage -- rather than hamper -- tourism.

Meteorologic, hydrographic, oceanographic, and other observation stations, either manned or automatic, could be constructed on the floating structures, all of which would be useful insofar as they could provide constant data unaffected by land influences.

Based on the experience that would be gained, it should be possible to build veritable complex, floating artificial islands, with multiple purposes of great economic interest in addition to power production. Some of these would be: easy docking and handling of large capacity ships (ore carriers, tankers); elimination or reduction of costly navigation maintenance operations in docking areas (dredging, dike construction, and so on); and the use of floating platforms for storing cargo, petroleum, ores, and so on. But this is intended for a somewhat later future.

What does concern us intensively, are the present problems: their solution requires that we act now.

[Question] And so you have taken a first and most important step -- the patent. Along with the laboratory tests. What else have you undertaken?

[Answer] To the best of our knowledge (and as the inventors we ought to know) nothing has been done. The status of our team at the Institute is for the time being uncertain. All the work was done on a volunteer basis, outside of our working hours. We are not complaining in the least: the Institute provided us with facilities, and showed understanding for our ideas and drive; but once the experiments finished and the patent granted, no further progress can be made along these channels. We are of course aware of priorities and we understand that everything cannot be done at once; yet we do believe that more concrete steps should be taken -- even if initially on a modest scale -- in this new but promising direction. As a measure of the idea's vitality and interest, we will point out that we have recently been joined by other specialists and technicians with whom we have begun to collaborate: engineers Alexandru Constantinescu and Dumitru Gavrila, colleagues at the Institute; Eng Mihai Enache of the Romanian Institute for Marine Research (IRCM), in Constanta; Eng Gabriel Tatu, of the School for Hydrotechnology of the Bucharest Construction Institute; as well as by a group of highly interested workers, technicians, and engineers in Vaslui.

[Question] What do you propose to do?

[Answer] Because the problem, in our opinon, is of national interest, it would be natural that all interested institutes participate in its solution. This implies the creation of organized channels of contact and collaboration among institutes and among specialists. A symposium was recently held in Constanta on this topic, under the auspices of IRCM. This was a welcome event, but its nature was primarily informational. We believe that the time has come for workshops, and high priority should be assigned to the construction of a first laboratory station at sea. Even if administered by a single institute, this station should be placed at the disposal of all those who want to field test solutions found in their own laboratories. Once preliminary results are obtained with this station, it would be possible to perform more exact economic calculations as well as improvement and development studies.

As for us, we are convinced that the Ministry of Electric Power, the National Council for Science and Technology, ICEMENERG (Institute for Power Research and Modernization) -- who is also the holder of Patent No 66,305 -- IRCM in Constanta, the Hydrotechnical Research Institute, and other potentially interested institutes and organs, will demonstrate the necessary acceptance, and that the inventors will not have to remember Eminescu's verses:

"No one will understand the thought
That echoes through your song;
The song forever carried on
The waves, the waves, the wind!"

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YUGOSLAVIA

DYNAMIC BEHAVIOR OF SPECIAL 18-AXLE RAIL CARRIER ON STRAIGHT TRACK, CURVES

Belgrade TEHNIKA in Serbo-Croatian No 11, 1979 pp 2307-2311

RUSOV, LAZAR, dr, associate professor of mechanical engineering at the School of Mechanical Engineering in Belgrade

[Abstract] Equations are derived for determination of critical speeds of a loaded 18-axle rail carrier which has six three-axle revolving trucks and is designed to carry separators for nuclear power plants. The length of the carrier is 43 meters, the weight of the loaded transporter 36 kN and the range of curve radii studied 150-250 meters. The model used for theoretical determination of the critical speed consists of the following premises: total weight of transporter and load is symmetrically distributed; separator is free to shift 500 mm laterally relative to trucks; lateral contact of first three trucks with outside rail by wheel of first axle and with inside rail by wheel of last axle; all forces acting within horizontal plane of top of rail; and motion of the revolving trucks on a curve consists of translational motion and rotating motion. The equations derived differ from those conventionally used because the criteria for estimation of the stability of motion could not be applied to this carrier. This study was the basis for comprehensive numerical computation of all forces, vertical and lateral, affecting the carrier, critical speeds for curves of various radii, and the ratio of lateral pressure on the rail to static pressure on the wheel, whereby safety against derailment is ensured. Measurements made during experimental runs of the loaded carrier confirmed all the basic premises of this study and led to issuance of the permit for nuclear power plant separators to be carried by the Yugoslav Railways. Figures 4; equations 27; references 2: 1 Russian, 1 Western.

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